REMARKS

Claims 17-22, 38-49, and 51-52 are pending. Claims 17-22, 38, 39, and 43-49 including independent claims 17, 38, and 47 were rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,532,484 Sweetser et al. Claims 51-52 are new.

Claims 17 and 47 are amended to include the limitation of "delay reading the selected pixel for a defined length of time that corresponds approximately to the exposure time of the pixel while in use." Support for these amendments may be found on page 9, first full paragraph, lines 2-4, and second full paragraph, lines3-5; page 10, third paragraph, lines 7-8; page 11, last full paragraph, lines 4-8; and, Figure 4A box 505.

Claim 21 is amended to recite, "further comprising selecting a pixel to test." Support for this amendment may be found on page 3, third full paragraph; pages 11, last partial paragraph; and originally filed claims 30 and 37.

Claims 22 and 38 are amended to particularly set out and clarify the "electronically resetting" operation. Support for these amendments may be found on page8, last full paragraph; page 9, second full paragraph; and page 10, last partial paragraph.

Claim 38 is also amended to include an operation of "applying a type of pixel correction mechanism." This amendment corrects an antecedent basis for claims 39 and 41. Support may be found on page 13, first and second full paragraph; pages 14-15; and Figure 4C.

Claim 43 is amended to particularly point out a feature of the present invention that if a partially corrupt pixel is determined to be saturated, it will be corrected by a masking technique instead of a gain adjustment technique. Support for this amendment may be found on page 14-15, bridging paragraph.

Claims 51-52 are new. Support for claims 51 and 52 may be found on page 11, last full paragraph, lines 4-8; page 8, last line and page 9, first line; and, page 9, second full paragraph.

Rejections Under 35 U.S.C. 102(b)

Applicants believe that the claims as amended are novel over Sweetser and are allowable.

Sweetser describes a "defective pixel signal substitution in thermal imaging systems," including a mechanism to thermally test and to electrically test an array of pixels for defects. Sweetser also discloses a gain adjustment mechanism.

Sweetser discloses an electrical stimulation method to produce signal excursions for

detection and substitution process (column 8, lines 13-67 and Figure 3). The detection and substitution process is described as follows:

> In substitution processing mode, switch 108 contacts terminal 118 and voltage supply circuit 106 supplies common electrode 102 with a low level varying voltage from source 120 superimposed on the bias voltage from DC source 116. In one embodiment, focal plane array 18 may be blocked from varying incident infrared radiation while pixels 20 are stimulated over their operating range by the low level varying voltage generated from source 120. The signals produced by the stimulated pixels 20 may then be sent to video processor 24 for detection and substitution processing. (column 8, lines 47-57)

Applicants found no discussion or suggestion of any intentional time delay between the electrical stimulation and the signal production in Sweetser. A wait or a delay for a specified duration, however, is specifically disclosed and preferred in the present application (page 9, first full paragraph, lines 2-4, and second full paragraph, lines3-5; page 10, third paragraph, lines 7-8; page 11, last full paragraph, lines 4-8; and, Figure 4A box 505). For example, a system "delays reading the pixels for defined length of time that preferably corresponds approximately to the exposure time of the pixels while in use." (page 11, lines 29-31) Thus Sweetser does not anticipate claims 17, 47, 51, and 52 because it does not teach or suggest any specifically introduced time delay between the electrical stimulation and the signal production. It is acknowledged that there may be incidental delay, as there may be a gap between the time of stimulation and reading, but this is not specifically delaying the reading of the pixels for a defined length of time that corresponds approximately to the exposure time of the pixels while in use. Specifically awiting this defined length of time provides a variety of benefits and allows for more accurate reading and testing of pixels with conditions that more closely mirror field conditions.

Moreover, the present application discloses a sequence of operations for "electronically resetting" a pixel that is not taught in Sweetser. Specifically, the photodiode of the present application is isolated via a transistor associated with that particular pixel, and it switches on or off to allow a charge to accumulate during the wait time. The sequence of operations including switching on and off the transistor and discharging the pixel is not taught or disclosed in Sweetser. In fact, Sweetser stimulates the pixels "over their operating range by the low level varying voltage" that is "superimposed on the bias voltage from DC source 116." Applicants submit that "stimulating" the pixels over their operating range is in no way the same or can be said to anticipate resetting the pixels by discharging them individually. Thus, Sweetser does not

anticipate claims 22, 38, and 52 because it does not teach or suggest a reset operation that including switching transistors on and off and individually discharging pixels.

Lastly, the present application discloses a novel method for determining an imaging technique based on whether the pixel is corrupt and whether the pixel reading is saturated. The Examiner has taken official notice that it is well known in the art that when a pixel contains charge below the threshold value, the pixel is partially full and therefore, partially saturated; when a pixel is above a threshold and is viewed as fully corrupted, the pixel is full of charge and therefore, fully saturated. Applicants acknowledge this definition of saturation during fault analysis.

In claim 40, Applicants claimed a further step of determining whether the pixel is partially saturated or completely saturated. This determining operation must be performed before a type of pixel correction is applied—otherwise the correction mechanism cannot be said to be determined based on the saturation status. Only images taken need be corrected. The saturation determining operation uses measured charge from an image, not the output voltage measured in claim 38 associated with a fault test. This difference is explained in the specification in the context of Figure 4C where a pixel correction technique is determined:

> [If the pixel is saturated,] it is impossible to know how much radiation actually illuminated the pixel during exposure. Because of this, the output is unusable and the system must resort to masking the pixel with the outputs of other (surrounding) pixels. Hence, the saturated partially corrupted pixel is treated like a completely corrupted pixel. (page 14, last partial paragraph, lines 4-8).

For example, pixel A is determined to be a partially corrupted pixel. In order to determine how to correct its output for image X, its saturation status for that image is determined based on its charge level relative to a maximum for the pixel. If it is not saturated, then its output is gain adjusted for image X. If it is saturated, then its output is masked for image X. Pixel A may be saturated for image X but not for image Y. In that case, pixel A is treated as partially corrupted pixel for image Y but as a totally corrupt pixel for image X. Thus during pixel correction, the corruption and saturation status may not correlate for a pixel while during fault analysis they correlate.

Sweetser makes no distinction between saturation and partially saturated pixels during gain normalization or during detection and substitution. During gain normalization, the methods of Sweetser may overcorrect a saturated pixel by reducing the output from 100%, but the methods of the present application would instead mask the output of such a pixel because "it is impoosible to know how much radiation actually illuminated the pixel during exposure." Thus,

Sweetser does not teach or suggest determining a pixel correction mechanism based on whether the pixel is partially or completely saturated and does not anticipate claims 40, 41, 42, or 43.

Rejections Under 35 U.S.C. 103(a)

Claims 40-42, 49, and 50 were rejected as being obvious over Sweetser et al. The Examiner noted that if one were to set the threshold value of Sweetser et al to a value that represents if a pixel is saturated, then all saturated pixels would be removed from the image and quality improved. Applicants submit that based on the distinction argued above for the charge value used for corruption status (based on a discharge) versus the charge value used for the saturation status (based on an image), the claims are not obvious with respect to Sweetser. If the threshold value of Sweetser is set to a value at which the pixel is saturated, then normal pixels receiving high amount of radiation during imaging would be deemed corrupt along with highly sensitive pixels. The next effect would be to reduce contrast—not necessarily improving image quality. The invention of the present application does not deem normally saturated pixels as corrupt and cause unnecessary contrast reduction. The invention of the present application only deems partially corrupt pixels receiving a saturated charge as totally corrupt for a particular image. Not only does Sweetser not "explicitly say that the threshold value is set to a value that will indicate that a defective pixel is saturated," even if it did so disclose it would not read on the present application.

CONCLUSION

In light of the above remarks, the rejections to the independent claims are believed overcome for at least the reasons noted above. Applicants believe that all pending claims are allowable in their present form. Please feel free to contact the undersigned at the number provided below if there are any questions, concerns, or remaining issues.

Respectfully submitted,
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